

What is claimed is:

1. A compound semiconductor device comprising:
a substrate formed of a first compound semiconductor;

5 a graded channel layer formed on the substrate,
and formed of a second compound semiconductor layer
of which an energy band gap is made narrower inside
than both ends by positioning a peak of a
distribution of one constituent element into the
10 inside and by continuously changing a ratio of the
one constituent element in a thickness direction,
and doped with an impurity;

a barrier layer formed on the graded channel
layer;

15 a gate electrode formed on the barrier layer to
come into Schottky-contact with the barrier layer;
and

a source electrode and a drain electrode formed
on both sides of the gate electrode to flow a
20 current into the graded channel layer.

2. A compound semiconductor device according to
claim 1, wherein the second compound semiconductor
layer is composed of a material that one constituent
element is added in the first compound semiconductor,
25 and the one constituent element has a function which
makes the energy band gap of the second compound
semiconductor layer narrower than that of the first

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Sub
X1

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8. A compound semiconductor device according to claim 1, wherein the first compound semiconductor

constituting the substrate is GaAs, and the second compound semiconductor layer constituting the graded channel layer is an InGaAs, and the one constituent element contained in the second compound semiconductor layer is indium.

9. A compound semiconductor device according to claim 1, wherein the first compound semiconductor constituting the substrate is GaAs, and the second compound semiconductor layer constituting the graded channel layer is a GaAsSb or an InGaSb, and the one constituent element contained in the second compound semiconductor layer is indium or antimony.

10. A compound semiconductor device according to claim 1, wherein the first compound semiconductor constituting the substrate is InP, and the second compound semiconductor layer constituting the graded channel layer is an InAsP or a GaAsSb or an InPSb, and one constituent element contained in the second compound semiconductor layer is indium or antimony.

11. A compound semiconductor device according to claim 1, wherein the second compound semiconductor layer is consisted of a ternary or quaternary of group III-V semiconductor including at least one of gallium and indium as group III element and including at least one of arsenic, phosphorus, and antimony as group V element.

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